

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 99-NE-44-AD; Amendment 39-12957; AD 2002-23-13]

RIN 2120-AA64

Airworthiness Directives; Pratt & Whitney Canada PT6A Series Turboprop Engines

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), that is applicable to Pratt & Whitney Canada PT6A series turboprop engines that have certain turbine exhaust ducts that were modified by a number of different companies. This amendment requires inspections for low-quality welds and cracks of a large population of turbine exhaust ducts. This amendment is prompted by reports of cracks along the weld seams of certain turbine exhaust ducts. The actions specified by this AD are intended to prevent failure of the turbine exhaust duct due to cracking that could result in possible separation of the reduction gearbox and propeller from the engine, and possible loss of control of the airplane.

DATES: Effective December 31, 2002. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of December 31, 2002.

ADDRESSES: The service information referenced in this AD may be obtained from Pratt & Whitney Canada, 1000 Marie-Victorin, Longueuil, Quebec, Canada J4G1A1. This information may be examined, by appointment, at the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: James Lawrence, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7176; fax (781) 238-7199.

SUPPLEMENTARY INFORMATION: A supplemental proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an AD that is applicable to Pratt & Whitney Canada PT6A series turboprop engines was published in the Federal Register on June 10, 2002 (67 FR 39640). That action proposed to require inspections for low-quality welds and cracks of a large

population of turbine exhaust ducts that were modified by a number of companies, all using a similar unapproved gas tungsten arc welding (GTAW) process instead of the resistance (seam or stitch) weld process. Since the issuance of that supplemental proposal, Pratt & Whitney Canada issued a revised SB P&WC SB No. PT6A-72-1610, Revision 2, dated October 1, 2002, which deletes models PT6A-114 and PT6A-114A from the applicability.

Bilateral Agreement Information

This engine model is manufactured in Canada and is type certificated for operation in the United States under the provisions of section 21.29 of the Federal Aviation Regulations (14 CFR 21.29) and the applicable bilateral airworthiness agreement. Pursuant to this bilateral airworthiness agreement, Transport Canada (TC) has kept the FAA informed of the situation described above. The FAA has examined the findings of TC, reviewed all available information, and determined that AD action is necessary for products of this type design that are certificated for operation in the United States.

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

Request To Remove SAL Reference

One commenter requests removal of any reference to Standard Aero Limited (SAL) of Winnipeg, Canada, from the AD. Since the first issue of the NPRM, the FAA has found that several other companies have incorrectly used the GTAW weld process. Therefore, any references to SAL can and will cause confusion for the operators.

The FAA agrees. All references to SAL are removed from the final rule.

Misinterpretation of Unsafe Condition

The same commenter points out that the SNPRM incorrectly notes that TC AD CF-98-14 says "that condition if not corrected could result in possible separation of the reduction gearbox and propeller from the engine and possible loss of control of the airplane," and that the TC AD actually states that compliance is required "to minimize the possibility of an in-flight shutdown due to a cracked exhaust duct."

The FAA does not agree. The FAA feels that the commenter has misinterpreted the unsafe condition statement in the proposal's preamble, incorrectly attributing it to the TC AD. Based on the structure of the preamble, the FAA understands how the statement could be attributed to the TC AD. However, the FAA has determined "that condition if not corrected could result in possible separation of the reduction gearbox and propeller from the engine and possible loss of control of the airplane," is the correct unsafe condition. Since the questionable section does not appear in the preamble of the final rule, no change needs to be made to the final rule.

Incorrect Total of Cracked Ducts

The same commenter remarks that the SNPRM incorrectly states that a total of 116 exhaust ducts have been discovered with cracks along the affected weld seam, when in fact, to date the actual number of cracked ducts found with cracks is 18.

The FAA agrees. However, since the questionable statement does not appear in the preamble of a final rule, no change needs to be made to the final rule.

Request to Exclude Single Port Exhaust Duct

One commenter requests that the single port exhaust duct, P/N 3112171-01 and subsequently any reference to the PT6A-114 and PT61-114A engine models be excluded from the AD. For conversion of single port exhaust ducts, part number (P/N) 3112171-01, welding is done in a much different fashion. The original inner cone remains in place and the majority of it is untouched. Only a small portion of its free end is removed for the attachment of a cover. No welding is performed anywhere on or near the load bearing outer skin. The original junction between the outer skin and the inner cone is entirely undisturbed so adhesion between the propeller reduction gearbox flange and the outer skin is entirely unaffected and the load path is uncompromised.

The FAA agrees. The FAA has consulted with P&WC and has confirmed that the commenter is correct. The inner skin replacement is performed differently on a single port duct than on the dual duct. No welding is done in the "A" flange area for the -114 series. It was the welding at the "A" flange that triggered the original TC AD. There have been no reports of cracks or poor welds on the -114 models. P&WC has revised the -114 manuals to clearly state that the "A" flange is to be examined in detail at aircraft minor (150 hours) inspections and at hot section inspection. The PT6A-114 and PT6A-114A engines have been incorrectly included in the proposal. Therefore, models-114 and -114A, and exhaust duct P/N 3112171-01 are removed from the final rule.

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes described previously. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Economic Analysis

There are approximately 22,000 Pratt & Whitney Canada PT6A series turboprop engines of the affected design in the worldwide fleet. The FAA estimates that 7,000 engines installed on airplanes of U.S. registry will be affected by this AD, that it will take approximately 2 work hours per engine to perform the required actions, and that the average labor rate is \$60 per work hour. Based on these figures, the total cost of the AD to U.S. operators is estimated to be \$840,000.

Regulatory Analysis

This final rule does not have federalism implications, as defined in Executive Order 13132, because it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Accordingly, the FAA has not consulted with state authorities prior to publication of this final rule.

For the reasons discussed above, I certify that this action (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39—AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. Section 39.13 is amended by adding a new airworthiness directive to read as follows:

AIRWORTHINESS DIRECTIVE

Aircraft Certification Service
Washington, DC



U.S. Department
of Transportation
**Federal Aviation
Administration**

We post ADs on the internet at "www.airweb.faa.gov/rgl"

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

2002-23-13 Pratt & Whitney Canada: Amendment 39-12957. Docket No. 99-NE-44-AD.

Applicability: This airworthiness directive (AD) is applicable to Pratt & Whitney Canada (P&WC) PT6A series turboprop engines, with turbine exhaust ducts part number (P/N) 3012290, P/N 3031988, P/N 3032117, P/N 3035784, P/N 3035786, P/N 3105890-01, P/N 3112167-01, and P/N 3111780-01. These engines are installed on, but not limited to, Beechcraft King Air-90 and-100 series, Bombardier DHC-6 series, Empresa Brasileira de Aeronautica, S.A. (Embraer) EMB-110 series, Pilatus PC-6 series, and Piper PA-42 series airplanes.

Note 1: This AD applies to each engine identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For engines that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (g) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Compliance with this AD is required as indicated, unless already done.

To prevent failure of the turbine exhaust duct due to cracking that could result in possible separation of the reduction gearbox and propeller from the engine, and possible loss of control of the airplane, do the following:

Inspection of Turbine Exhaust Ducts for Low-Quality Welds

(a) If the engine has not yet been overhauled, and if the turbine exhaust duct has not yet been subject to a shop visit for repair, no further action is required.

(b) Otherwise, at the next shop visit or within 150 hours time-in-service (TIS) after the effective date of this AD, whichever occurs first, do the following:

(1) Inspect for low-quality welds created during repair, on the turbine exhaust duct near flange "A", in accordance with paragraphs 3B through 3E of P&WC service bulletin (SB) No. PT6A-72-1610, Revision 2, dated October 1, 2002, for models PT6A-6, -6A, -6B, -20, -20A, -20B, -21, -25, -25A, -25C, -27, -28, -34, -34AG, -34B, -36, -135, and -135A engines, and SB No. PT6A-72-12173, dated January 24, 2002, for models PT6A-11, -11AG, -15AG, -110, and -112 engines.

(2) If it is determined that the welds meet the acceptable criteria specified in SB No. PT6A-72-1610, Revision 2, dated October 1, 2002; or SB No. PT6A-72-12173, dated January 24, 2002, continue using the duct until the next scheduled overhaul. Inspect duct per the engine overhaul manual before reinstallation.

(3) If it is determined that the welds do not meet the acceptable criteria specified in SB No. PT6A-72-1610, Revision 2, dated October 1, 2002; or SB No. PT6A-72-12173, dated January 24, 2002, replace the duct with a serviceable part, or perform the initial and repetitive inspections in the following paragraphs.

Initial Visual Inspection of Welds That Do Not Meet SB Acceptable Criteria

(c) Use 5X magnification to visually inspect the circumference of the forward area of the exhaust duct from the propeller reduction gearbox mounting flange to 2 inches aft of the flange for any crack indications. Mark and record cracks and return the duct to service, or replace with a serviceable part as follows:

- (1) If no cracks are found, the duct may be returned to service; or
- (2) If three or less cracks are found, and the total cumulative length of the cracks exceeds 2.0 inches, replace the duct with a serviceable part; or
- (3) If any one crack exceeds 1.0 inch in length, replace the duct with a serviceable part; or
- (4) If any two cracks are separated by less than six times the length of the longest crack (6L) or 3.0 inches or less, whichever is the closest separation, replace the duct with a serviceable part; or
- (5) If more than three cracks are found, replace the duct with a serviceable part; and
- (6) Mark all allowable cracks, on the duct, with suitable metal marking material; and

Note 2: Marking materials that are suitable for use on the exhaust duct may be found in the P&WC Engine Manual.

(7) Record the length of the crack, location, number of duct hours, and time-since-overhaul (TSO).

Repetitive Visual Inspection of Welds That Do Not Meet SB Acceptable Criteria

(d) Repeat the inspection specified in paragraph (c) of this AD as follows:

(1) For ducts that did not exhibit any cracking at the last inspection, repeat the inspection within 150 hours TIS since the last inspection. Return the duct to service or replace with a serviceable part as specified in paragraph (c)(1) through paragraph (c)(5) of this AD.

(2) For ducts that exhibited cracking at the last inspection, repeat the inspection within 25 hours TIS since the last inspection. Return the duct to service or replace with a serviceable part as follows:

(i) Inspect for new cracks, and cracks that were recorded as specified in paragraph (c) of this AD. Return the duct to service or replace with a serviceable part as specified in paragraph (c)(1) through paragraph (c)(5) of this AD.

(ii) In addition, if the growth rate of an existing crack exceeds 0.015 inch per hour TIS since the last inspection, replace the duct with a serviceable part.

Optional Terminating Action

(e) Replacing an affected exhaust duct with a serviceable exhaust duct constitutes terminating action for the repetitive inspection requirements of this AD.

Definition of a Serviceable Exhaust Duct

(f) For the purposes of this AD, a serviceable duct is defined as a duct that meets the acceptability limits of this AD.

Alternative Method of Compliance

(g) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Engine Certification Office (ECO). Operators must submit their requests through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the ECO.

Note 3: Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the ECO.

Special Flight Permits

(h) Special flight permits are not allowed.

Documents That Have Been Incorporated By Reference

(i) The inspections must be done in accordance with the following Pratt & Whitney Canada (P&WC) service bulletins:

Document No.	Pages	Revision	Date
PT6A-72-1610	All	2	October 1, 2002.
Total Pages: 10			
PT6A-72-12173	All	Original	January 24, 2002.
Total pages: 9			

This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from Pratt & Whitney Canada, 1000 Marie-Victorin, Longueuil, Quebec, Canada J4G1A1. Copies may be inspected at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

Note 4: The subject of this AD is addressed in AD CF-98-41 in order to assure the airworthiness of these P&WC PT6A series turboprop engines in Canada.

Effective Date

(j) This amendment becomes effective on December 31, 2002.

Issued in Burlington, Massachusetts, on November 15, 2002.
Mark C. Fulmer,
Acting Manager, Engine and Propeller Directorate, Aircraft Certification Service.
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